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Research Interests

Process algebras, resource bounded optimization, autonomous agents and mobile robotics. General topics of interest include distributed computing, concurrency and interaction, evolutionary computing and neural nets, new computing paradigms, languages and architectures.

Current Research

- The $\$$ -Calculus of Bounded Rational Agents for Problem Solving, to optimize their behavior under bounded resources
- Common Control Language for Autonomous Underwater Vehicles
- SuperTuring Models of Computation
- Foundations of Evolutionary Computation
- UMassD mobile robotics and bioinformatics projects

Recent Publications

Book Chapters

- Eberbach, E., and D. Goldin, 2004. Wegner P., Turing's Ideas and Models of Computation, in: (ed., Ch.Teuscher) *Alan Turing: Life and Legacy of a Great Thinker*, Springer-Verlag, 159-194.
- Eberbach, E., 2003. Is *Entscheidungsproblem* Solvable? Beyond Undecidability of Turing Machines and Its Consequence for Computer Science and Mathematics, in: (ed., J.C. Misra) *Computational Mathematics, Modelling and Algorithms*, Narosa Publishing House, New Delhi, 1-32.
- Eberbach, E., 2001. Challenges Facing Computer Science in the 21st Century, in: (ed.J.C.Misra) *Applicable Mathematics: Its Perspectives and Challenges*, Narosa Publishing House, New Delhi, Mumbai, Calcutta, 2001, 565-573.
- Eberbach E., $\$$ -Calculus Bounded Rationality = Process Algebra + Anytime Algorithms, in: (ed., J.C. Misra) *Applicable Mathematics: Its Perspectives and Challenges*, Narosa Publishing House, New Delhi, Mumbai, Calcutta, 2001, 213-220.

Articles in Refereed Journals

- Burgin, M., and E. Eberbach, 2007. Cooperative Combinatorial Optimization: Evolutionary Computation Case Study, *BioSystems*, (in print, doi: [dx.doi.org/10.1016/j.biosystems.2007.06.003](https://doi.org/10.1016/j.biosystems.2007.06.003)).
- Eberbach, E., 2007. The $\$$ -Calculus Process Algebra for Problem Solving: A Paradigmatic Shift in Handling Hard Computational Problems, *Theoretical Computer Science*, 383(2-3), 200-243 (doi: [dx.doi.org/10.1016/j.tcs.2007.04.012](https://doi.org/10.1016/j.tcs.2007.04.012)).
- Eberbach, E., 2007. Approximate Reasoning in the Algebra of Bounded Rational Agents, *Intern. Journal of Approximate Reasoning*, Special Issue on the Probabilistic Approaches to Rough Sets, (in print, doi: [dx.doi.org/10.1016/j.ijar.2006.09.014](https://doi.org/10.1016/j.ijar.2006.09.014)).
- Eberbach E., 2005. Toward a Theory of Evolutionary Computation, *BioSystems*, 82(1), 1-19.
- Eberbach E., 2005. $\$$ -Calculus of Bounded Rational Agents: Flexible Optimization as Search under Bounded Resources in Interactive Systems, *Fundamenta Informaticae*, 68(1-2), 47-102.
- Wegner P., and E. Eberbach, 2004. New Models of Computation, *Computer Journal*, 47(1), British Computer Society, Oxford University Press, 4-9.
- Eberbach E., and P. Wegner, 2003. Beyond Turing Machines, *The Bulletin of the European Association for Theoretical Computer Science (EATCS Bulletin)*, 81, Oct. 2003, 279-304.